

From farm to fork: Rethinking food and drink supply chains

Part 2: The food and drink industry



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Key:

- Client quotes
- Insurance case studies
- Acceleration opportunity with industry partners
- General sector insights



An introduction to the food and drink industry

An introduction to the food and drink industry

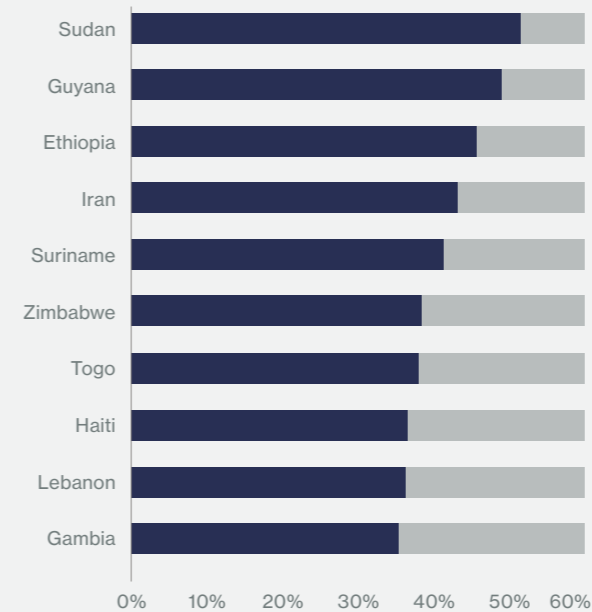
Food and drink is one of the largest global industries, with a total revenue almost \$11 trillion USD in 2021¹. It is a dynamic and complex sector that underpins global resilience.

In addition to direct operational issues and strategic goals, food and drink companies are also very reliant on the actions of their suppliers and customers. Food and drink supply chains operate at different scales and levels, from the shortest (from garden to table), to long, highly complex globalised supply chains (from farm to fork) as ingredients come together in products that we are all familiar with.

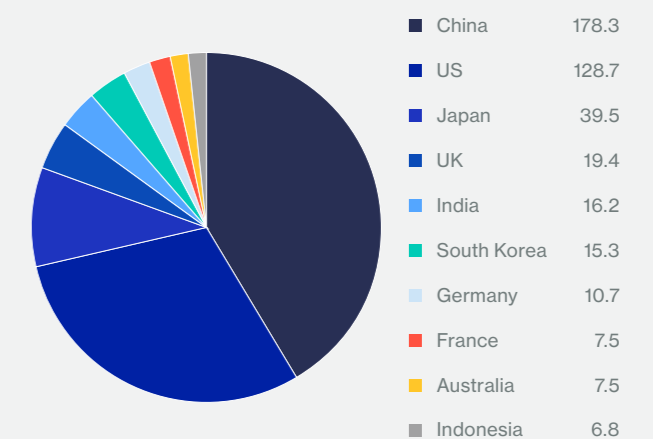
Businesses transformed themselves to adapt in the pandemic. Now, as the world continues to reopen, they are looking to maximise the potential from these changes – and years of investment in understanding and managing their supply chain risks. This continued transformation will be essential with the world’s population forecast to reach 10 billion by 2050, and demand expected to continue to grow significantly – land twice the size of India is expected to be needed by that time to support a 70% increase in food production². Meeting this need will require action across the value chain: eliminating pests and diseases; preventing loss in transport and distribution through poor storage; reducing food waste by retailers and consumers; and through supporting the transition to a low carbon economy.

Box 1

Fastest growing countries %



Key revenue markets (bn)



The food and drink industry’s global revenue is dominated by China and the US, with fast growth in key countries around the world³. Strong underlying growth factors such as population, urbanisation, and the expansion of the middle class translate into strong demand for the outputs of the food and drink industry.

Attributes of the food and drink industry

Highly competitive	Relationship driven	Fast moving	Highly regulated
<ul style="list-style-type: none"> - High consumer expectations and pressure on price, quality and sustainability - There is high competition for shelf space, and discounters have a strong market influence on price and product range - Cost pressures upstream and cost pressures downstream - Efficiency increasingly important with growing technology use for operational gains - Local labour demand competition at all levels, from operative to management - Economies of scale sought through growth ambitions - Early-stage (particularly tech-enabled) businesses are attracting private equity investment 	<ul style="list-style-type: none"> - Labour is key, and in many subsectors there is a reliance on a migrant workforce and older, more experienced management - Grocer/retailer partnerships and integration common - Communities matter, whether that's logistics relationships or sourcing new ingredients in the face of climate risks. In an increasingly connected world, broader relationships are needed with yet more stakeholders, and collaborative risk management is more important - Brand and reputation dependent upon quality and reliability 	<ul style="list-style-type: none"> - Adaptability, flexibility and speed are key to survival - Constantly changing consumer behaviours and preferences - Just-in-time manufacturing - Fragility to market shocks and supply chain disruption - Working from home dynamic started during the pandemic continues to unfold as all businesses consider the future of work - Fast-paced, which means companies can focus too much on the short-term - Continual product and process innovation - Pressing environmental impact demands 	<ul style="list-style-type: none"> - With a core hallmark being safe and secure food, the industry must meet mandatory standards across occupational health and safety, food safety standards, human rights, or infectious disease rules. Taxes and penalties can be severe - Increasing expectations around Environmental, Social, Governance (ESG) and international expectations, from consumers, governments, and regulators – both internationally e.g. United Nations Sustainable Development Goals or TCFD, and country specific obligations, e.g. British Retail Consortium net zero 2040 or national resilience strategies around food security



There are acquisition opportunities within small embryonic companies with a similar vision and good ethos around climate change and sustainability

Director of Group Risk and Assurance, food manufacturer



Most large multinationals... have enough power in their scale and product range that they can manage their relationships with supermarkets and pass on prices fairly well

Sector expert, global accountancy firm



All big meat processors are getting into plant-based production or diversifying

Journalist, Food Trade Journal



Regulation is an ever-increasing burden on the business. More legislation and sustainability requirements keep driving change and cost into the sector

Head of Group Risk, global drinks company



Food and drink supply chains

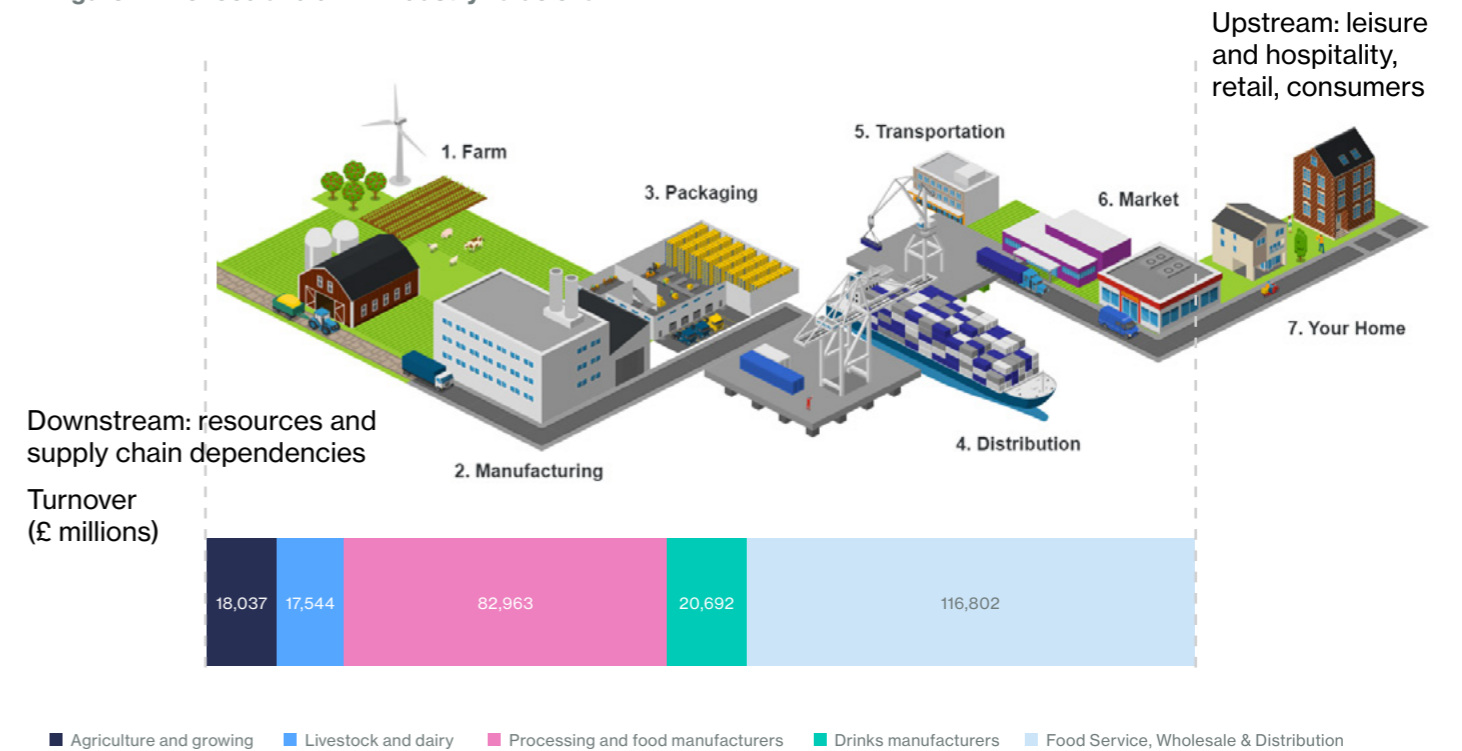
The industry is made up of a series of subsectors where food and drink products are produced, harvested, gathered or slaughtered; then cleaned, packed and stored; and finally typically processed in some way - from cutting and canning to complex manufacturing.

Then it is distributed – transported and traded – through various channels to both individual customers and commercial establishments. There are strong links between subsectors, with manufacturers and processors reliant on agriculture and livestock, and key dependencies that can cascade through the sector.

For example, in the summer of 2018 a shortage of carbon dioxide (CO₂) across Europe impacted the food and drink industry, with some companies having to pause production lines⁴. Food grade CO₂ is a by-product of ammonia manufacturing, and many plants were shut down simultaneously for essential maintenance and in response to increasing costs of natural gas used in the process. CO₂ is used across the industry in a number of ways including carbonating drinks, preserving fresh produce, and stunning livestock. As businesses look to build resilience and transform their operations in the transition to a net zero world, being able to identify these types of critical dependencies will be key; both at their own operations and through their relationships with suppliers as part of the procurement process.

Market research estimates the global food and beverage market size is expected to grow from \$5.8 trillion in 2021 to \$6.4 trillion in 2022 at a growth rate of 9.7%. The food and beverage market size is expected to grow to \$8.9 trillion in 2026 at a compound annual growth rate of 8.7%⁵. While a limited number of large companies hold a large share of revenue (in its Global 2000 list, Forbes estimates that the top 25 companies in the sector generated \$1.5 trillion USD in revenue in the past year⁶), the sector is dominated by SMEs in volume. This pattern is seen around the world, with SMEs making up 99% of Europe’s 290,000 entities⁷ who generate 40.5% of the region’s €1.1 trillion turnover⁸. Research⁹ also highlights this pattern in lower middle income countries, where micro businesses and SMEs play critical roles in food systems worldwide¹⁰. At the production stage, SME farms provide almost half of the total calories produced worldwide, including over 85% of fruit and vegetables (by volume) and approximately 80% of animal-source foods (e.g. meat and dairy) in sub-Saharan Africa¹¹.

Figure 1. The food and drink industry value chain



The pattern seen in turnover across the industry subsectors is indicative of the breakdown across the world, with manufacturing and wholesale and distribution the major value centres within the industry.

Source: UK Gov¹²

The subsectors of the food and drink industry

How they work, market drivers and trends

Agriculture and growing

What do they do?

Farms grow a range of vegetables, fruit, cereal and other crops (e.g. grains, pulses, oilseed, foliage, fibre, tubers, fruit). Businesses in the Northern hemisphere often rely on overseas operations to source out-of-season crops all year round. Farms vary from small individual operations to large scale operations and cooperatives. Many agriculture and growing businesses are also involved in wholesale and distribution. Companies in the industry may source a substantial portion of agricultural commodities from third-party growers in various countries. Therefore, managing sustainability risks within the supply chain is critical to securing a reliable supply of raw materials and reducing the risk of price increases and volatility over the long term.



Example companies:

- ADM
- El Tejar, Brazil
- Prodimex, Russia
- Cargill Corporation
- Barfoots of Botley
- Dyson Farming

Market drivers

Productivity is a key component of agriculture's economic performance and its competitiveness. Productivity metrics are based on the ratio of the volume of outputs compared to the volume inputs required. Time is of critical importance to the industry, as products take time to grow and harvest, and once harvested, products are perishable. Food consumption trends, government agriculture policy programmes, and the grain and oilseed export market are primary drivers of demand. Maximising crop yield and minimising disease risk are crucial for individual companies' profitability.

Trends

- Increased use of technology, both for improved efficiency and also as a result of labour shortages, including the use of autonomous equipment, particularly for larger scale operations, and aerial imaging for crop management
- Some processes are by nature difficult to automate and where this is the case, the labour shortage remains problematic
- The changing climate and impacts on water supply are a particular concern, with adaptations already underway where possible. In some cases this includes moving to regions where water is more plentiful

Livestock and dairy

What do they do?

Livestock and dairy businesses produce raw and processed animal products, including meats, eggs, and dairy products, for human and animal consumption. Key activities include animal raising, slaughtering, processing, and packaging. The industry's largest companies have international operations, and companies are vertically integrated to varying degrees, depending on the type of animal produced. Large industry operators typically rely on contract or independent farmers to supply their animals, and may have varying degrees of control over their operations. The industry sells products primarily to processing and food manufacturers and to retail distributors that distribute finished products to key end markets including restaurants and grocery retailers.



Market drivers

Demand is largely driven by food consumption trends in each respective region. For example, demand is affected by consumer preference for healthy products (e.g. Omega 3 fish and eggs), animal welfare (free range and organic), product cost and quality, and changing dietary habits around the world (particularly China). Feed is the single largest direct cost of raising animals and can be as high as 40% of overall farm revenues.

Trends

- Many farms remain labour intensive and **labour shortages** are a problem for many countries around the world
- Humane treatment of animals and the **recurring threat of animal disease** (e.g. avian flu, African swine fever) are key risks
- Threat of a **global recession and cost of living rises** are having an impact on spending. Meanwhile other factors are causing increasing cost of inputs, e.g. higher prices for animal feed as a result of less availability of grass

Example companies:

- JBS
- Pilgrim's Pride
- Lactalis
- Danone
- Muller
- Arla
- ABP Foods

Processing and food manufacturers

What do they do?

Food processing covers a variety of topics including fruit and vegetable processing, meat and seafood processing, canned goods, cereal and other packaged foods.

Manufacturers produce a wide range of food products, both branded and supermarket own-label. These products include ready meals, baked goods, frozen foods, fresh food items and canned and packet goods. Typically, these products are made ready to consume, are marketed to retail consumers, and can be found on food retailers' shelves and in leisure and hospitality outlets. The industry is characterised by large and complex ingredient supply chains, as many companies source ingredients from around the world. Large companies operate globally, and international opportunities are driving growth.



Example companies:

- Nestlé
- Mondelēz
- Associated British Foods
- Cadbury
- Unilever
- Mars

Market drivers

Food processing and manufacturing is subject to demand that is largely driven by food consumption. Companies compete on cost and the ability to distribute their product. The industry is capital-intensive, with high costs stemming from expensive industrial machinery. The majority of employees tend not to be highly skilled and due to labour shortages and a drive for increased efficiency, more work is being performed by machines/robotics. Where that is not possible, labour shortages are problematic. Major customers are supermarkets, distributors, food service distributors and hotel and restaurant chains. Manufacturers operated throughout the pandemic and generally fared well financially, where customers were predominantly supermarkets with high levels of demand for products.

Trends

- **Sustainability**, and in particular a reduction in carbon footprints, is a key driver for an energy-hungry sector. The drive for more environmentally friendly packaging is also a key battleground increasingly, decisions are being made by investors, customers, consumers and employees on the basis of a manufacturer's ESG credentials. The sector is also seeing growing demand from consumers for plant-based 'meat' products
- Increased focus on **health and wellbeing**, with a drive to reduce sugar, fat, calorific content of many products
- Raw material and input **costs, labour shortages** and **supply chain challenges** are high on the agenda

Drinks manufacturers

What do they do?

Drinks manufacturers include companies that manufacture and bottle soft and alcoholic drinks, as well as purify and bottle water. Many of these companies also engage in wholesale distribution of drinks. The industry is dominated by large, international companies. Companies partake in syrup manufacturing, marketing, bottling operations, and distribution, with larger companies typically being more vertically integrated into operations that bottle, sell, and distribute the finished products. The industry's factories are highly automated, extensively using mechanical automation and computerised robotics.

The primary raw materials used to produce soft drinks are water, flavoured syrup, corn syrup or sugar, and containers. Containers may be glass bottles, aluminium cans, or plastic bottles made from polyethylene terephthalate (PET). Products such as Coca-Cola and Pepsi employ a two-tier process to manufacture and distribute their products. A two-tier process occurs when a primary manufacturer (for example Coca-Cola) produces concentrate, which is then sold to a bottler to manufacture and distribute the final product.

Market drivers

Customer tastes, demographics, trends in alcohol consumption, and personal income are the primary drivers for drink demand. Demand for some drink products (especially alcoholic drinks) tends to be seasonal, peaking during both the winter and summer.

Trends

- Increased focus on **health and wellbeing**, e.g. a reduction of sugar content
- **Sustainability**, in particular with regard to packaging, with many businesses undertaking “out of plastics” projects and eliminating secondary packaging

Example companies:

- Coca-Cola
- PepsiCo
- Nestlé
- Britvic
- Diageo



Food service, wholesale and distribution

What do they do?

Food service businesses often have an element of manufacturing or processing as part of their operations, supplementing their core products with a range of third-party products to provide a complete product range to customers. Many individual food sellers and purchasers do not have the opportunity to negotiate directly with their counterparts because of the time, effort, and complexity that transactions entail. The volume and diversity of the required supplies may also vary. Wholesalers are large intermediaries in the food distribution system, allowing them to reconcile supply and demand in terms of volume, quantity, geography (markets), and time. Products are typically sourced worldwide and include fresh meat and produce, prepared foods, processed foods, baked goods, frozen and canned foods, non-alcoholic and alcoholic beverages, and a wide selection of household goods and personal care products. Warehouses are used to store purchased food items that are made available on the market. Wholesalers can have a food product specialisation such as seafood, fresh produce, or fruits.



Market drivers

Customers include small independent retailers, fast food outlets and leisure outlets such as hotels and restaurants. A common selling point is the ability to provide goods in a short time frame from the point of order. A development has been the expansion of 'last mile facilities' to get closer to local markets, reduce supply chain disruptions and meet sustainability targets. Buildings ranging from 10,000sq ft in rural areas to 30,000sq ft in metropolitan hubs¹³ sit alongside improvements in fleet efficiency and investments in electric vehicles¹⁴.

Trends

- **Green logistics and sustainability**, moving to alternative fuels
- **Shifting customer base** and food trends
- Stringent **regulatory landscape** including food safety and food labelling (both including allergens)
- **Healthy and plant-based foods**

Example companies:

- Sysco
- US Food Holdings
- Bid Corporation
- Jollibee Foods Corporation
- Performance Food Group

Supply chain risks

What do we mean by supply chain risks?





Supply chain risks can mean different things to different people and can be multidimensional. Some are within an organisation's control and others – like geopolitical risks – have systemic elements that go beyond the balance sheet of any one institution:

Supply risks:	Impact inbound supply, implying that a chain of suppliers cannot meet the demand in terms of quantity and quality of finished goods
Operational risks:	Impact elements within a supply chain, impairing its ability to supply services, or finished goods within the standard requirements of time, cost, and quality
Demand risks:	Impact elements of the outbound supply chain where the extent or the fluctuation of the demand is unexpected

Risks



Factors

 Environmental	 Geopolitical	 Economic	 Technological
<ul style="list-style-type: none"> - Natural disasters - Extreme weather - Pandemics and epidemics 	<ul style="list-style-type: none"> - Political instability - Trade restrictions - Terrorism - Theft and illicit trade - Piracy 	<ul style="list-style-type: none"> - Demand shocks - Price volatility - Border delays - Currency fluctuations - Energy shortages 	<ul style="list-style-type: none"> - ICT disruptions - Infrastructure failures

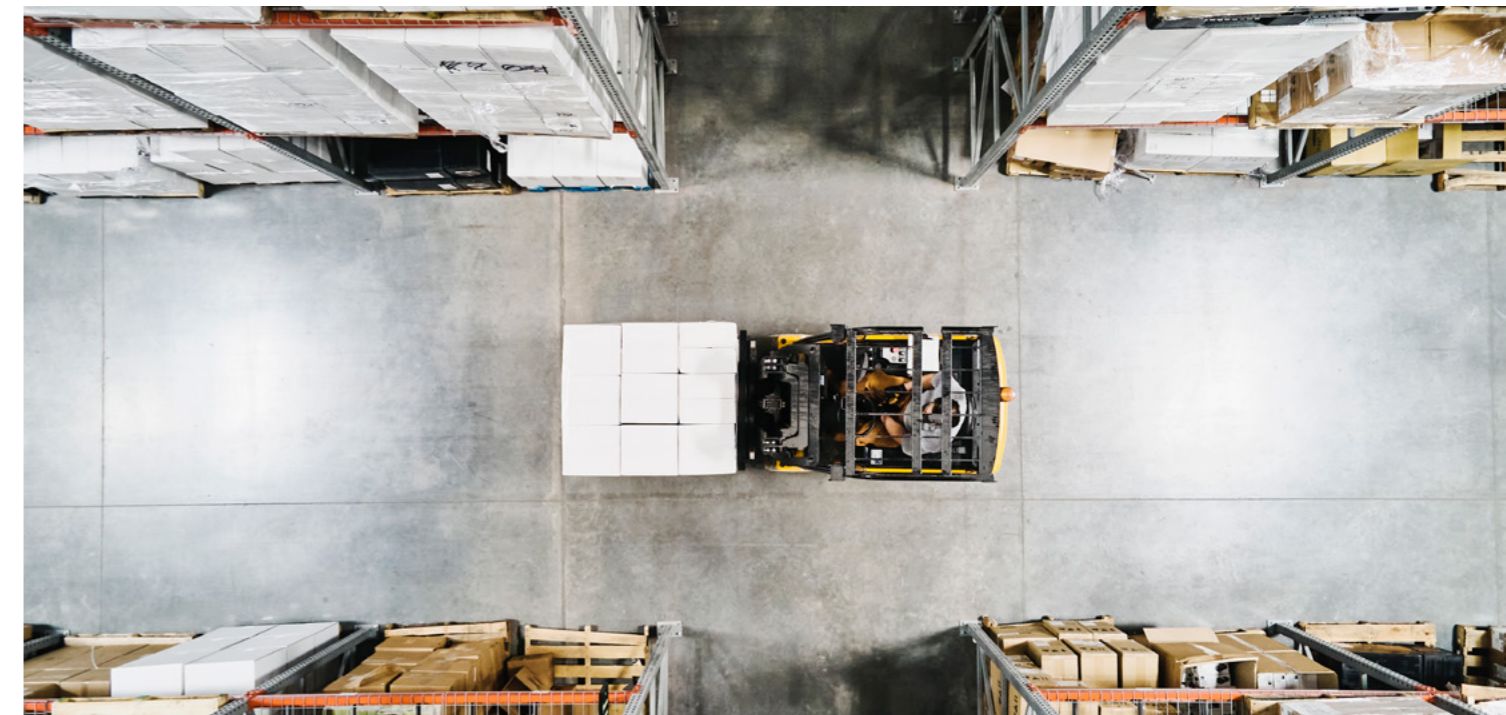
Supply chain risks are at the forefront of food and drink businesses' minds as, regardless of the source, an interruption to a supply chain can cause an array of problems – from loss of market share and revenue, to reputational damage, breach of contract and damage to stock price. As a result, food and drink businesses are actively managing and aware of their supply chain risks.


Over the past four months, we have surveyed and interviewed over 275 risk, supply chain, and insurance practitioners, and these perspectives have provided real-life, practical insights into the challenges that companies across the food and drink industry are facing as a result of the highly interconnected world we live in, and a historic – but now changing – reliance on just-in-time business models.


















What supply chain risks are food and drink businesses concerned about?

Table 1 (below) highlights the key strategic and operational supply chain risks facing the food and drink industry across its subsectors. Notable risks to the food and drink supply chain stem from dependence upon other critical sectors including energy, transportation, borders, labour, key inputs (additives and ingredients), and data communications. The criticality of site location, i.e. where an organisation's operations are concentrated in a single or limited number of sites, is often a key vulnerability, particularly if those sites rely on a sole source utility such as water. This has been seen in action across continental Europe this summer, where a heatwave has led to the drying up of reservoirs and crucial waterways, hampering critical trade¹⁵. As well as wider transportation links, ingress and egress to a business's own site and associated road network are also on their minds for their own operations and for suppliers attempting to deliver critical materials such as CO₂, packaging and raw materials.

Some of these key supply chain risks have potential insurability challenges, highlighted in *italics*. These include potentially systemic risks such as pandemics, macroeconomic factors (e.g. inflation), currency fluctuations, or environmental factors (e.g. climate change, resource, and biodiversity loss). Other commercial trading risks like fines or penalties, movement restrictions, or labour availability are also often excluded from cover, as are non-damage supply chain risks like fuel shortage.



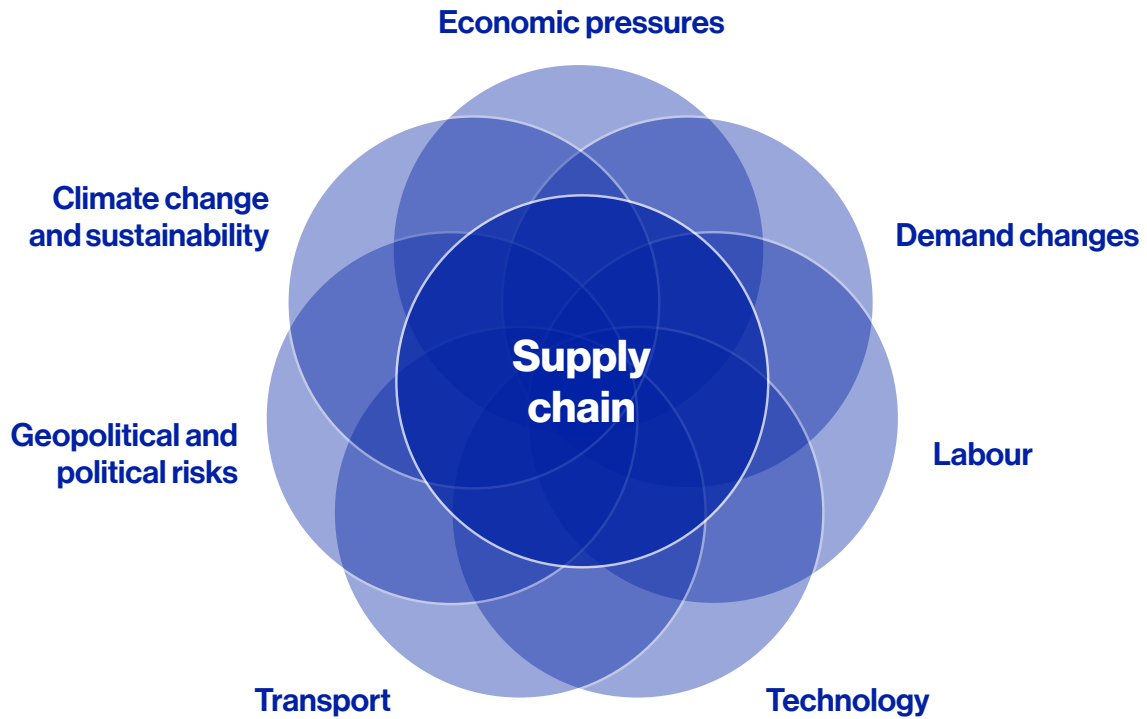
	Risk Description	Livestock	Agriculture and growing	Manufacturing	Processors	Food service	Wholesale and distribution
	Significant property damage event e.g. fire, flood	X	X	X	X	X	X
	Damage to third party premises (TP warehouse, supplier premises, customer premises)	X	X	X	X	X	X
	Denied access/egress (regulatory or otherwise)	X	X	X	X	X	X
	Loss in transit (e.g. raw materials, including temperature-controlled)	X	X	X	X	X	X
	<i>Fuel shortage</i>	X	X	X	X	X	X
	<i>Labour availability</i>	X	X	X	X	X	X
	Cyber risk	X	X	X	X	X	X
	Adverse weather	X	X	X	X	X	X
	Crop: disease/pestilence/yield levels/quality/level of biodiversity	X	X				
	Livestock and aquaculture: disease (e.g. zoonosis: AI & ASF)		X				
	Drought/water shortage/availability of water	X	X	X	X	X	X

	Risk Description	Livestock	Agriculture and growing	Manufacturing	Processors	Food service	Wholesale and distribution
	Epidemic	X	X	X	X	X	X
	Pandemic	X	X	X	X	X	X
	Climate change	X	X	X	X	X	X
	Biodiversity loss	X	X	X	X	X	X
	Cost inflation/ raw materials and inputs	X Fertiliser	X Abattoir services	X Packaging, raw materials	X	X	X
	Currency fluctuation	X	X	X	X	X	X
	Financial penalties	X	X	X	X	X	X
	Fines	X	X	X	X	X	X
	Political risks (e.g. war, expropriation, Brexit)	X	X	X	X	X	X
	Movement restrictions	X	X	X	X	X	X
	Product contamination and recall, integrity and traceability	X	X	X	X	X	X
	Reputation risk	X	X	X	X	X	X
	Shortage of a key raw material or input	X Fertiliser	X Feedstock	X Packaging, raw materials	X	X	X
	Loss of a key customer	X	X	X	X	X	X
	Loss of a key supplier (property damage, solvency or reputational issue)	X	X	X	X	X	X
	Breakdown or unavailability of key equipment, and consequent business interruption	X	X	X	X	X	X
	Failure of utilities (e.g. electricity)	X	X	X	X	X	X

Key risks and drivers

Out of the wide range of risks mentioned, the following are the key supply chain risks and drivers of most concern to the sector:

Figure 3: Supply chain risks and drivers



Economic pressures

Economic pressures dominate business risks in the current climate. The unstable economic situation and market volatility are both a major concern around supply chain risks, and hence on the mind of every business. In turn the necessity for improved resilience is driving increased costs e.g. additional storage for finished product as a result of nearshoring.

Inflation is impacting manufacturers through every aspect of their operation with increased costs in wages, energy, raw materials and consumables (CO₂ and packaging and equipment costs). Current uncertainties are further exacerbated by the unfolding Ukraine conflict and resulting global impacts. In August 2022 for example, the UK's largest CO₂ plant halted production due to rising energy costs¹⁶ - a striking reminder for many UK businesses of the events in 2018 described earlier.

Risk leaders are also proactively exploring impacts together with procurement teams, including how to manage for risks such as interruption to transport services or new climate change standards e.g. carbon reduction targets. One UK company interviewed is already thinking about a potential repeat of the restricted energy power supplies and reduced working weeks experienced during the 1970s. On the resilience side, some drinks manufacturers are exploring carbon capture during production to secure their own CO₂ supply.

A further consideration relates to economic pressures on their workforce, as explained by a risk manager at a major manufacturer: "Can they physically afford to work, travel to work, be reliable, or will we be looking at people taking second or third jobs and an increasing level of business disruption or accidents and errors as a result?"

Quotes from interviewed food and drink practitioners



Inflation is the main driver of risk and increased costs across the production and distribution cycles

**Company Secretary and
Group General Counsel at a drinks company**

The two key risks are Labour and Inflation. All other risks, like the insurable ones of fires, contaminated food/product recall, calamitous accidents, cyber, pale into insignificance compared to the real and present commercial challenges of driver shortages and inflation

General Counsel of a food company

Our energy bill will be twice the cost of our total payroll

CFO of a major food supplier

Inflation has affected all suppliers and competitors. Recovery has been difficult, but it has been achieved if the alternative for retailers is no supply

CFO, food manufacturer

We're reaching a commercial boiling point in trying to pass on higher costs

**General Counsel and Company
Secretary at a food manufacturer**



Demand changes

The impact of broader economic contraction on customer demand was also highlighted through the interviews and in one case it was reported that this is already being seen downstream at retailers, who are becoming more cautious and requiring tighter lead times for delivery to prevent their own supply chain issues. This is impacting normal demand volumes, requiring adjustments to existing processes and disrupting 'normal' activity. One risk leader suggested that the logistics sector is undergoing a significant period of change, arguing that businesses used to operating 'just-in-time' processes are now operating closer to 'do we have it in stock' processes.

Consumer demands have also changed. While previously the trend was for more requests for fresh and sustainable produce. Most recently in response to price increases many are trading down, for example from fresh fruit and vegetables to frozen, with reduced waste adding to cost savings. In response to these changes and others, manufacturers have been looking at new ways to manage product supply, such as additional storage and staged supply.

Looking ahead, other factors such as ESG and evolving consumer tastes were also considered to be instrumental in influencing future demand volumes.

Quotes from interviewed food and drink practitioners

“

Supermarkets really want their suppliers to manufacture their goods on our shore so they're not exposed to that supply chain risk

Sector Expert at a law firm

I expect there'll be intellectual property risk around the chemical laboratory food processes for flavours, tastes and textures produced that have longevity so they don't deteriorate

Director of Group Risk and Assurance, food manufacturer

Less meat eating... but more for health and environmental reasons, rather than animal welfare or ethics... Flexitarian (mostly plant-based) buying behaviour is a trend that will endure

Food and drink industry academic

There's a healthy eating trend, but don't think it's just houmous and pomegranate seeds - bread and cakes are mass market products

CFO at a food manufacturer

Consumer demand for year round produce means that we will need to continue securing produce from areas of the world considered to be problematic

CFO of an agricultural growing business

”

Labour

The pandemic, an aging workforce and inability to attract new talent¹⁷ has caused serious difficulties with availability, recruitment and retention of labour, leading to higher wages, training and replacement of staff at all levels from factory operatives to crop pickers, HGV drivers to supply chain specialists.

The haulage sector, which is essential for the transport of both components and finished goods across many supply chains, has been particularly affected, with industry bodies estimating a shortage of 80,000 drivers in US alone. Many food and drink supply chains are highly reliant on the trucking sector, with the American Trucking Association estimating that about 72% of America's freight transport moves by trucks¹⁸.

Looking further across the sector, recruitment and retention difficulties reflect the physical nature of operatives' work, necessitating increased automation in the manufacturing environment. As more systems are digitised, this both increases the availability of data to monitor supply chains and the number of touch points for vulnerabilities – as explained in the technology section.

Several issues were raised in our discussions with risk practitioners:

- Wage inflation and rising labour costs, due to both labour supply and demand challenges and the broader economic pressures mentioned earlier
- A rise in socioeconomic unrest also presents risks to the labour force, as currently seen in an increasing number of sectors such as the rail and postal strikes in the UK in 2022 and in 2021 at a global food manufacturer in the US¹⁹. The broader climate of social disruption, protests and unrest associated with economic but also social and political challenges and highly visible activists (such as climate change hydrocarbon and sea capitalism) can increase the likelihood of industrial action affecting supply chains
- The challenge of successfully attracting and retaining staff in a maturing industry was also raised. The easiest way to attract staff is to pay more money, which then fuels the labour inflation position. This point led into a broader consideration of the overall UK logistics network that requires a capacity and reconfiguration for the 21st century and an overhaul of railways, hubs and local transport. This in turn then correlates to the environment and sustainability agenda

- The increasing challenge to recruit suitable talent, may bring with it the associated risk of insider threat (not only ideological but also just criminal, and/or fraudulent), as employers are potentially forced to take what they can find. This position can be further aggravated by location of operations, e.g. if the majority of an organisation's supply chain operations sits in a rural area the labour pool becomes even smaller

Quotes from interviewed food and drink practitioners



Labour availability is a key issue. In terms of economics, there's a bidding war for low-skilled individuals locally, training costs to replace lost skills and the cost of new process efficiencies

**Health, Safety and Environment Director
at a food manufacturer**

Everything revolves around people: the right amount, the right training, the right qualifications, the right culture, but the labour market is the worst it's been since, probably, the 1970s

Head of Logistics and Operations at a food company

It's difficult to recruit at all levels. Our vacancies are over 100% higher than our previous normal rate and our labour costs are increasing

Company Secretary at a major food manufacturer

And associated with that the increasing challenge to recruit suitable talent, comes insider threat, as we potentially have to take what we can find

Risk & Operations Director for a global drinks company



Technology

The food and drink industry continues to see wider automation, the harnessing of Artificial Intelligence (AI) and the deployment of Internet of Things (IoT) devices. Such moves widen the cyber security challenge for a sector with operations that have traditionally prioritised performance and safety over cyber security. A further consideration for resilience lies in IT infrastructure, which can be reliant on third-party outsourced providers. If not carefully coordinated, these can lead to disruption or failure of existing systems. For example, new “dark warehouses”, which are fully automated and systems driven, are extremely vulnerable to cyber-attack.

WTW global cyber claims data shows the manufacturing sector overall is the second highest sector in terms of cyber insurance claims frequency, and the impacts of a cyber-attack can be wide ranging as the attack surfaces multiply. In May 2022, the world’s biggest producer of beef, pork and chicken by sales, saw many of its global slaughterhouses disabled by a cyber-attack, with facilities in the U.S., Canada and Australia seeing disruptions and shutdowns to various degrees²⁰. Global food producers had seen 40 such cyber-attacks in the 12 months preceding the incident at the meat producer, a sign the industry is becoming an attractive target.

Changes in technology and the evolving nature of cyber-attacks are all adding to the pressure on food and drink manufacturers to modernise their cybersecurity or face a widening range of undesirable consequences. This is changing the risk profile with a shift from production specialists to technology professionals and adding to ongoing recruitment needs. All industries are facing a global war for tech talent, and investment in training existing staff and attracting new talent will be critical.

Several issues were raised in our discussions with risk practitioners, who identified some areas of opportunity against the many challenges presented by rapidly developing technology and cyber threats:

- Judicious capex on automation, robotics, AI, digital business systems and the cloud can help meet long-term operational efficiency goals and drive value creation
- New developments in technology such as driverless vehicles, robots and AI will also affect the future of transportation both at strategic and operational levels

- Technological advances are being used by some in the sector to address labour shortages and rising labour costs. “We’re considering initiatives that would not necessarily be considered without the labour shortage,” said one general counsel at a food manufacturer

Quotes from interviewed food and drink practitioners



Automation and robotics change the risk profile... [for the] better, as there’s less human health and safety errors or incidents... However, new tech requires new training, new competencies, new people, different health and safety procedures

Head of Logistics and Operations at a food company

There will be more automation as people become more expensive. Operative numbers will go down, but software engineer numbers will increase

General Counsel and Company Secretary at a food manufacturer

Robotics, powerful AI and digital products means we can automate financials, business analytics, manufacturing processes, smooth out material flow supply chains...this speeding up will improve efficiency

Director of Risk and Insurance at a food manufacturer



Transport

Transport-related risks (whether haulage or container availability, or shipping lane closures) were raised in every conversation, and for some businesses resulted in significant changes to manufacturing timescales and, at times, in some delays in delivery to customers.

Critically, whilst there is enough food produced around the world²¹ this requires the effective operation of global supply chains to feed people and communities – 25–30% of global food produced is lost between on-farm food production and its storage at a retail facility, largely as a result of poor supply chain management and spoilage²². The transition to a low carbon economy and the expansion of developments such as biofuels and solar farms²³ is also shifting agricultural land from food production to other uses. The transition of a low carbon economy and use of agricultural land for solar production has interesting global differences. In some regions the use of solar panels is perceived as a removal of land (UK), and in others an opportunity to make land viable for production, as seen in Kenya where the use of solar panels is increasing water retention in dry regions and supporting agriculture on new land²⁴.

Congested or restricted shipping routes are a key factor in transport capacity. Examples include the South China Sea and the Ireland/UK shipping leg, which has a very limited number of routes and ferries. The loss of any of these could cause significant supply chain disruption. Where food and drink businesses rely on longer shipping lanes, they are at particular risk if there is a lane blockage (e.g. Ever Given), port disruption, adverse weather or ‘gazumping’ (space or passage given to another shipper offering higher fees).

Wider issues raised included:

- Limited container availability is impacting capacity and reliability of supply. The knock-on effect of these on the business can be significant, requiring changes in manufacturing timescales and, at times, in some delays in delivery to customers
- Restricted shipping capacity from ports was also noted - particularly for smaller, less developed ports across the world. Following experiences during the COVID-19 pandemic, many risk managers are concerned that an infectious disease outbreak could lead to prolonged closure of a port
- Haulage driver availability continues to be a cause for concern, although this has eased somewhat recently from the height of the labour shortage
- In many regions, not least the UK, neither road nor rail networks are fully geared to today’s supply chain demand²⁵. From climate resilience to industrial strike action, the future of moving goods will require conversations at the national policy level, wider investment in transportation methods and consideration on where distribution/warehouse nodes are needed

Quotes from interviewed food and drink practitioners



The Russia/Ukraine conflict will bring huge challenges around logistics, payment systems, fertilisers, etc

Head of Client Services at a food producer

Driverless vehicles – hub to hub “trunkers” are probably 10-15 years away” (i.e. not long-haul, overnight journey vehicles)

General Counsel and Company Secretary, food manufacturer

Take Senegal, where there is only one fast boat and one slow boat per week

CFO, Grower

We have seen a massive increase in shipping costs e.g. seafreight up 300-1000% and road (airfreight has been eliminated), plus increase in storage costs and regulations

Finance Director at a farming business



Geopolitics

Given the recent global conflicts and political events which have dominated both domestic and international news channels, it is unsurprising that geopolitical and/or political risk was mentioned by every person interviewed. Some risk leaders are preparing for rolling blackouts in the coming winter as a result of threat of reduced energy supply linked to conflict in Ukraine (covered in depth in our recent report [Ukraine: A conflict that changed the world](#)). In some countries the food and drink industry is considered a key component of national infrastructure and businesses may be protected by governments – but this will not be the case in all countries, and rising energy costs are straining balance sheets. Looking to the future, the growth in regional trade agreements may add new dimensions to supply agreements and require businesses to respond to geopolitical agreements²⁶.

Many countries and businesses are pivoting towards reshoring supply chains as a means to achieve self-sufficiency and more control over access to priority goods and services. The disruption to critical exports from Ukraine, such as grain, and recent energy policies by Russia to limit export presents a significant threat to global food security. Wider global examples include China imposing punitive trade quotas on Australia in retaliation to its support for an international inquiry into China's handling of the coronavirus²⁷.

Wider issues raised included:

- Companies are revising or reviewing future geographical development plans as a result of geopolitical instability
- Apprehension around the impact on supply chain of political conflicts in Africa, and social unrest in South America. Brexit has also added hidden delays and higher costs to business, in terms of increased bureaucracy and administration, affecting consistency and continuity
- Concern was displayed over China's unique position as a primary supplier for many critical products and goods across the world with particular mention of their zero covid policy, multiple complete lockdowns, and global impact on container availability and positioning

Quotes from interviewed food and drink practitioners

“

I think interest in trade disruption insurance (TDI) is going to increase if all of the major geopolitical elements that we bring to the table come into play"... if you think about the strategic importance of the Strait of Hormuz with oil, even though we try and move away from oil, and the Suez Canal, I think that's a real problem... the South China Sea, in the next decade, if not sooner, is going to blow up and be a real problem, I believe.

Risk & Operations Director, global drinks company

Disruption, protests, and unrest associated with economic but also social, political, and with existing activists, such as climate change hydrocarbon and sea capitalism

Risk & Operations Director, global drinks company

Starting to see more of a problem in relation to social unrest in places like South America, in relation to labour rates and laws. There have been some changes in governments, towards more left leaning politics, putting in large wage increases. Starting to see things like striking workers blocking roads

CFO, fresh produce processor

”

Climate change and sustainability

The food and beverage sector depends heavily on the natural world for its raw materials and resources. For example, research suggests that the food and drink industry consumes 70% of the world's fresh water to grow and manufacture its products²⁸. Increasing pressure on those resources, along with the need to meet global climate goals, may explain why environmental factors emerged as the greatest risks to business success over the medium term in the WTW Global Food and Beverage survey.

Extreme weather events such as droughts have caused crop failures and a lack of fresh water in other parts of the world²⁹ (see Box 3, below for additional detail). All risk leaders interviewed were sensitive to the issue of water availability and impact on supply chain in the event of shortage or interruption and there was a clear awareness of environmental and sustainability factors such as packaging, CO₂ usage, measurement of environmental impact of suppliers, empty miles¹ etc.

Climate change is understood as a long-range risk impacting the external landscape from procurement to supply chain, as well as internal operations such as warehousing, energy, production, business continuity within the supply chain. Climate and adverse weather risks were referred to in every conversation with specific examples such as El Niño (affecting Peru or Ecuador and the central and eastern Pacific Ocean) and La Niña (affecting the tropical west coast of South America) given as possible to probable sources of supply chain disruption. Conversely, the unintended

consequences of sustainability efforts impacting farmland, such as rewilding land or installing solar panels, versus national food security are currently under debate.

Businesses are adapting to try to manage climate change risks, including moving sites to regions where water is more plentiful. One respondent based in the UK reported that reservoir and extraction sources had been exhausted for some of their operations and they were actively considering new mitigations such as building a new reservoir and developing new water strategy around recovery of wastewater. Problems stemming from too much water or not enough have hit the headlines in 2022 with extreme event level floods and droughts; however, water quality is also a growing concern. Groundwater contamination in the US has reduced the water resources available for some production processes³⁰, and there is long-running concern around sea level rise impacting low lying regions in South Asia reliant on groundwater aquifers³¹.

Although manufacturing of packaging is changing to become more environmentally friendly, with an emphasis on the “out of plastics” project across manufacturing, one respondent reported teething troubles with some of the new packaging being damaged in transit. Another business mentioned the unintended consequences of a new national glass recycling scheme increasing costs for Scottish producers – this is actively in discussion with industry³⁵.

Box 3: Water quality

As food systems use freshwater from both surface water and groundwater sources, the quality of water is the primary consideration in the food production process. In the US, agriculture constitutes the main source of pollution in rivers and streams, the second main source in wetlands, and the third main source in lakes³². Contaminants from agricultural activity are largely considered nonpoint source pollution. As irrigation and stormwater runoff moves off fields and farms, pollutants are picked up, transferred, and then deposited into lakes, wetlands, and coastal waters, significantly affecting the availability of the water supply. California's agricultural sector, for instance, is responsible for over 400 different commodities and produces more than 99% of dozens of crops, representing one quarter of the US's entire food supply and employs nearly half a million people. Half of all failing water systems in California are based in the centre of California's agricultural output, the Central Valley³³. Groundwater contamination, coupled with decrepit infrastructure, drought, and cuts in water allocation, are having a significant impact on water-intensive crops such as almonds, pomegranates, avocados, raisins, as well as meat procurement, affecting businesses' ability to effectively bring products to market and resulting in lost revenue, leading to the largest amount of empty farmland in decades³⁴.



Quotes from interviewed food and drink practitioners

“

Sourcing of drink ingredients from Ecuador and India could be affected by climate changes or crop failures... This has occurred in the past

Head of Safety and Logistics Operations

We're aiming to reduce carbon footprint, but we're a major user of gas, electricity and diesel. Some plants have solar panels and CHP sources and we've introduced EVs to start replacing diesel trucks. This is a potential new infrastructure risk: fire hazard from charging on site rather than filling up at a diesel garage

General Counsel and Company Secretary,
food manufacturer

As a fruit grower, we're looking at new frost-free irrigation systems and we're linking up with a University for new technology investigations

Head of Beverages, food producer

Packaging materials are easier to source than last year, but there's still long lead times, so we're securing supplies at least 12 months, instead of say 6 months, in advance

Head of Safety and Logistics Operations

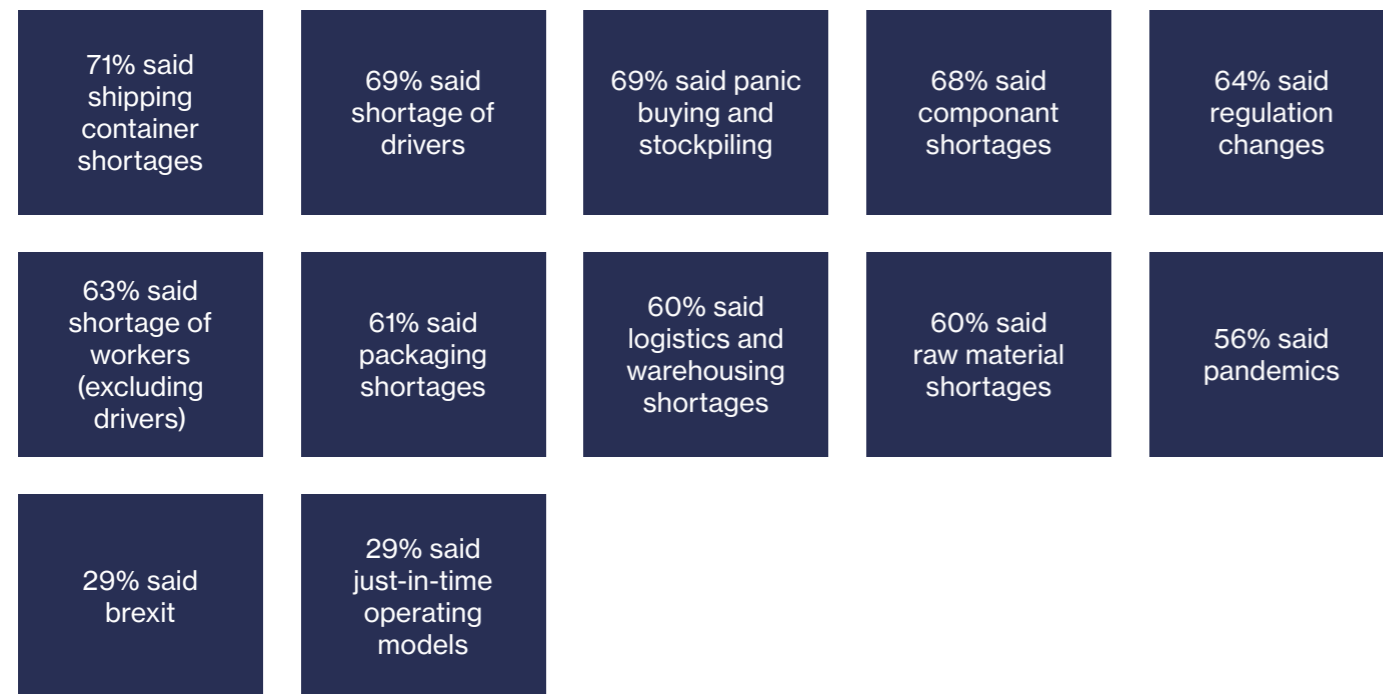
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¹ Empty miles refer to the mileage that is accumulated while driving an empty container or trailer and not earning revenue

WTW Global Food and Beverage Survey 2022

To gain a view on what risk leaders expect to face in the short term, WTW surveyed 250 risk leaders in global food and drink businesses. When asked what supply chain challenges they expected to face in the next two years, they responded as shown in the table below:

Figure 4. Food and drink supply chain challenges food businesses expect to face in the next two years



Box 4: Key regional risk factors challenging food and drink businesses

North America: 51% of business leaders saw environmental risk as the greatest threat to their success. As well as concern over natural resources, named by **79%** among their top environmental risks, this may reflect the rise in climate-related extreme weather – there have been more than 20 weather events in the U.S. in the last few years, each causing more than \$1bn in damage.

EMEA: In Europe, customs and logistics issues following Brexit were the number one concern at **64%**.

APAC: Pandemics remain the biggest issue, named by **42%** of respondents there, as outbreaks of COVID-19 continue to surge in parts of the region.

Latin America: Here businesses were most worried about the cost and availability of inputs (**50%**), reflecting supply chain issues and also the region's vulnerability to volatile commodity prices.

WTW also asked businesses about the internal and external risk factors they expected to face in the next three to five years that pose the greatest risk to their success. Environmental risk/climate change/severe weather events and cost and availability of inputs were highlighted as the greatest external factors, and both also featured during the 1:1 interviews held with the sector, with sentiment strengthening since the survey took place. Some risk factors had regional implications, underlining the deep local and cultural influences that drive the market for food and beverage products (see Box 4).

Figure 5: Risk factors challenging food and drink businesses in the next 3 – 5 years

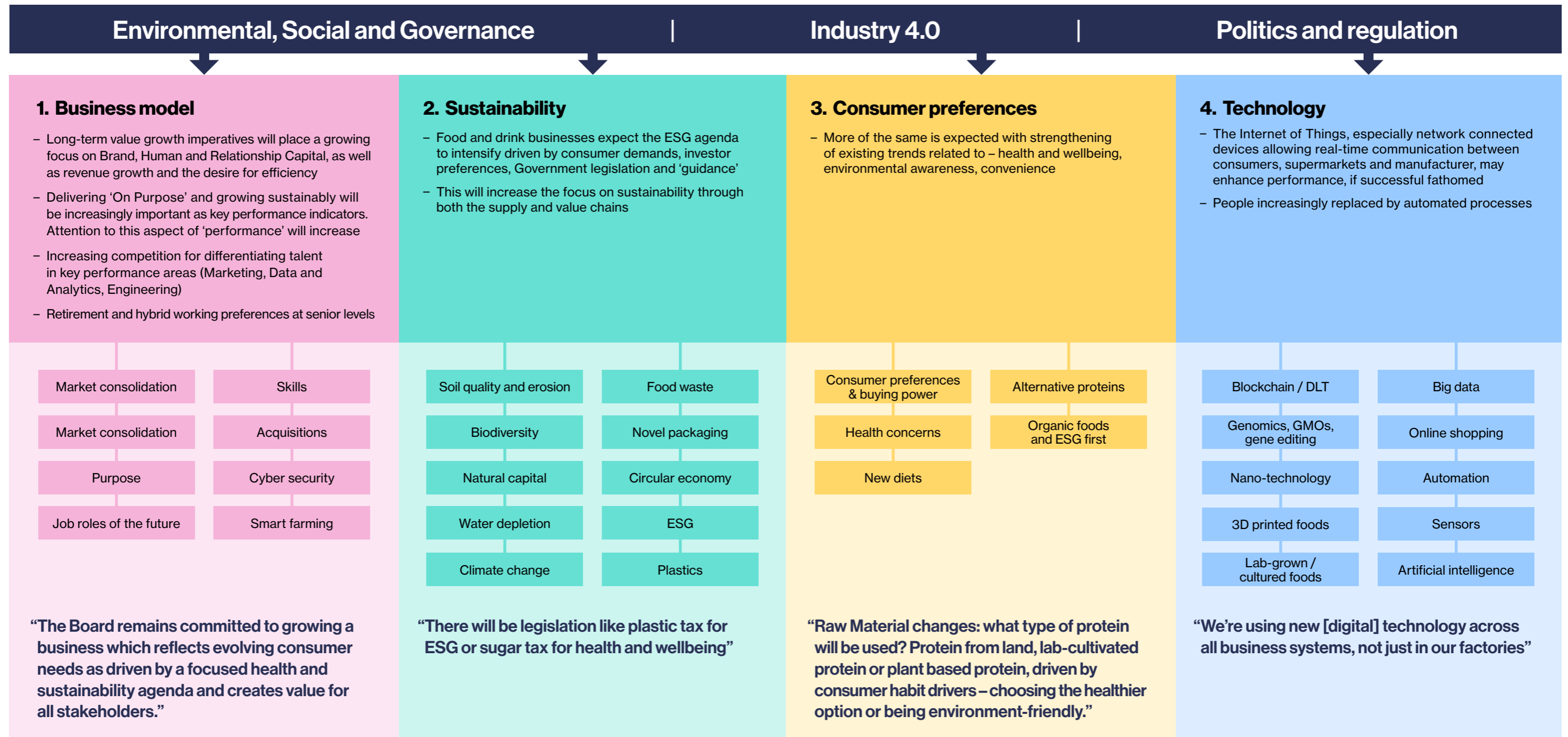


Source: WTW Global Food and Beverage Survey 2022

The future risk landscape

As well as the shorter-term risks and drivers facing businesses now, there are four key areas where change is expected to increase:

Figure 6: A forward look at drivers, trends and risks



Source: Compiled from WTW Food and drink industry interviews and RAND Europe³⁶

Business model

From a broad business perspective, long-term value growth will sit centre stage, driving increased emphasis on brand, human and relationship capital, as well as revenue growth and the desire for efficiency. Success will be measured against the ability to deliver against stated intentions and growing sustainably – both in terms of revenue growth and being a good global citizen. Challenges will include increasing competition for differentiating talent in key performance areas such as marketing, data and analytics and engineering whilst indications are that we will see increasing retirement and hybrid working preferences being expressed at senior levels.

In terms of supply chain trends specifically a number of key trends are worth highlighting:

Complementing supply chain efficiency with supply chain resilience to reduce impact of disruptive risk. Even relatively linear supply chains, such as those in the food and drink industry, can still comprise a number of products or commodities that are sourced, manufactured or stored in multiple locations, thus resulting in complexity and increased risk. Complexity can mean reduced efficiency as managers struggle with the day-to-day risks of delays and fluctuations, and it can lead to increased risk of disruption, in which dependencies between products can bring everything to a halt. Moving forwards, it is likely that supply chain risk managers will seek to control the amount of complexity by designing supply chains to contain risk (employing strategies such as segmentation and regionalisation) rather than allow it to spread through the entire supply chain, therefore leading to higher cost efficiency and reduced risk. An example of this being driven by efforts to reduce carbon footprints is companies further up the value chain working with smallholder farmer suppliers to support reduction of their carbon footprint by paying the capex for green technologies³⁷.

Introduction of more sophisticated supply chain modelling. As the use of AI and quantum data becomes more commonplace, supply chain risk managers will increasingly turn to supply chain modelling tools to build their knowledge of risks and the mitigations available. Another major benefit of these data tools is the ability to quantify losses in a more scientific way and, consequently, providing underwriters with the depth and detail of data they require to write the risk more accurately

Increased stress testing of supply chain risk. As sophistication of modelling improves, this will enable more comprehensive stress testing, allowing companies to understand and prioritise supply chain risks. Stress testing approaches are likely to be deployed more frequently in the future, allowing supply chain managers to identify mitigation measures on a near, medium and long term basis and reduce the impact of disruptive risk. Ensuring these meet increasing stakeholder reporting interests will be essential.



Sustainability

In our previous section on supply chain risks linked to sustainability, we discussed how companies are addressing this challenge now. Notably, the drivers are not just corporate but are also fuelled by consumers and investors, with increasing demands for more transparency about the origin and impact of products which are, in turn, reflected in growing regulatory pressures. Regulation and the move to integrate sustainability and ESG reporting into financials are expected to be the biggest driver of action. Data requirements are not yet clear, but there are numerous groups delivering frameworks (see Figure 7 and Box 6).

In response, food and drink companies and industry groups are working towards developing and meeting new ESG commitments, reporting requirements and frameworks (see figure 6). An early innovator in this space includes Nestlé who in 2019 disclosed a list of its suppliers alongside data on its priority raw materials as part of its Responsible Sourcing programme³⁸. This was the first disclosure of its kind in the industry – we expect to see more businesses take this approach as they respond to emerging national regulation.



The ESG agenda is huge - a high priority. It's where everyone is at - all stakeholders: financiers, employees, consumers shareholders

Group Treasurer, food manufacturer

The European Commission's "Farm to Fork" strategy³⁹ foresees the development of an EU sustainable labelling framework by 2024 with the goal to make our food systems more environmentally-friendly, fair and healthy. Collaboration between organisations in the food system is likely to increase in 2023 and food brands will be under greater pressure to further develop integrated sustainability roadmaps. Companies have been working with third-party companies such as the Carbon Trust for a number of years to verify the carbon footprint of individual products. Carbon Trust states it has certified over 27,000 individual product footprints, with its labels used in more than 40 countries⁴⁰.

Policymakers will also be expected to start to introduce further legislation that encourages sustainable and ethical practices within the food system, which also plays a key role in the development of alternative fuels and may see further demands on global stocks. Roughly 70% of current global wheat is used for food, and nearly 20% is used for livestock feed. While corn is the preferred feedstock in the US and sugarcane in Brazil, wheat is one of the main crops for biofuel production in the EU, accounting for 2% of Europe's grain supply, followed by sugar beet and maize. By 2030, the EU wants to increase the share of renewable energy in transport "to at least 14%, including a minimum share of 3.5% of advanced biofuels"⁴¹.

Box 5: Sustainability initiatives and innovators as new sources of supply chain data

Sustainability strategies: Coca-Cola are striving towards a 2030 water security strategy⁴⁴, which includes targets to achieve 100% "regenerative water use" in water stressed areas. The plan to do this by reducing, recycling, and reusing local water supplies, deeper engagement with agricultural suppliers, and collaborative efforts to develop watershed protections plans in regions of China, India, Kenya, and the U.S. Midwest. ESG legislation is seen by businesses as the main driver of change in the industry. Investors, retailers, consumers, employees, as well as the manufacturers' own values, are also driving interest.

Sustainability innovators: BanQu, a South African start-up focused on mapping out and tracing recyclable material, is supporting customers, producers, and aggregators of waste products to track and audit recyclable supply chains along the entire chain of custody, down to the first contributor⁴⁵.

Figure 7: Sustainability frameworks and reporting initiatives ^{42, 43}

Task Force on Climate-Related Financial Disclosures

Average level of disclosure across the 11 recommended disclosures for fiscal year 2020 was 30% - an uplift of 10% on 2019. 50% of F&D companies reported on their Risks and Opportunities and 48% on their Climate-Related Metrics

Carbon Disclosure Programme

In 2021 CDP saw a 28% disclosure rate from the food, beverage and agriculture industry, representing a substantial increase from the 9% disclosure rate achieved in 2020

Sustainability Accounting Standards Board now IFRS Foundation

Disclosure topics and standards covering accounting metrics for 7 food and drink subsectors

UN Global Compact

In addition to the UN Global Compact principles, the food and agriculture sector has been issued with a further set of voluntary principles to report against on an annual basis to 'lead the way to sustainable agriculture and food security for all'

Global Reporting initiative

'GRI 13: Agriculture, Aquaculture and Fishing Sectors' was launched in July 2022. The standard is the first global and holistic sustainability reporting standard for all companies in the upstream production of crops, animals and seafood, setting expectations for disclosure of their shared distinct impacts. GRI 13 was developed by a 19-member multi-stakeholder working group, with agriculture, aquaculture and fishing organizations represented alongside investors, civil society mediating institutions and labor bodies

Box 6: Datasets and tools

If you can't measure, you can't manage. As more and more companies analyse and report on their greenhouse gas emissions, supply chain emissions have grown in both focus and importance.

Datasets: CERES research outlines two global lifecycle assessment databases providing emission factors for food products: the World Food LCA Database (WFLDB) and Agri-footprint. Variables include environmental impacts associated with the production, processing, and cooking (in the case of WFLDB) of food and agricultural products. Data is provided at the unit process level – for example, N₂O emissions embodied in 1 kg output fresh (crop) product, unpackaged, at farm exit.

Initiatives: Cool Farm Tool is an online calculator that enables farmers to measure their greenhouse gas emissions and understand mitigation options for agricultural production. Originally initiated by Unilever, the tool provides scientifically robust quantification methods that are sensitive to farm and field scale management choices. Agricultural Life Cycle Inventory Generator (ALCIG) is a tool that calculates life cycle inventory data for crop products. The tool allows companies to generate custom product-level emission factors using the same methods and background datasets that are used to generate the factors in LCA databases such as Ecoinvent and the WFLDB. GLEAM is a spatially explicit life cycle assessment model for the livestock sector. It covers 11 livestock commodities at global scale: meat and milk from cattle, sheep, goats and buffalo; meat from pigs; and meat and eggs from chickens.

Sustainable supply chains: As insurers consider emissions across whole insurance portfolios, access to data and being able to share their views during risk conversations is an opportunity to support the transition to a sustainable future. An example of where insurers are putting this into practice is a partnership explored in the Lloyd's Lab, where Tokio Marine Kiln and CarbonChain have gone on to pilot a methodology framework to measure customers' emissions and compare them with their industry and regional peers. This can then be translated into a 'carbon risk rating' to be taken into account when considering underwriting of each policy⁴⁶.

Consumer preferences

Between consumers, government food strategies⁴⁷, regulation – such as national sugar taxes implemented by over 50 countries⁴⁸ – and investors driving action², the dial is being moved, with further change expected to come.

With the world population forecast to reach 10 billion people by 2050, global food demand is expected to continue to grow significantly – the United Nations estimates that land twice the size of India is expected to be needed by that time to support a 70% increase in food production⁴⁹.

It's not just the number of people, consumer preferences are changing. Food sustainability has become more important for two-thirds (64%) of 18–24-year-olds in Europe in the past year⁵⁰. Meat companies are also starting to invest more in plant-based meat alternatives start-ups and technologies to support a shifting customer base. Collaboration between these sectors is going to be crucial for the future of sustainable protein diversification.

With a wider demand for sustainable alternatives to traditional food products, this trend also extends beyond meat. The United Nations General Assembly has declared 2022 as the International Year of Artisanal Fisheries and Aquaculture seeking to make seafood production more sustainable, and this is supported by an increase in innovation to develop alternative seafood ingredients and products.

Technology

The application of technological innovation is seen as crucial to help solve some of the big challenges facing agriculture and food production, with one of the largest being the application of smart agriculture to increase climate resilience. This may in turn support the viability of insurance. These range from applied research projects at global universities to accelerator initiatives at major financial institutions like the World Bank looking to connect the value chain. For example, the Lincoln Institute for Agri-food Technology (LIAT) is exploring a range of applications (see Figure 8) and is the world's first Centre of Excellence in Agricultural Robotics. Companies are also investing in their own initiatives (see Box 7).

Box 7: Digital first communities

Land farming is also undergoing a technology renaissance, especially in the robotics, computer vision, artificial intelligence, and sensor spheres. In Africa, big data and emerging technologies are becoming mainstays of the continent, with the aim of empowering local farmers, businessmen, and shareholders to contribute to a circular economy built on inclusive growth and development. Given the large share of agriculture as a percentage of the continent's GDP, ample opportunity exists for implementation of new and disruptive technologies.

Traceability and transparency are two of the biggest market forces driving digitisation and are seen as essential in building consumer loyalty and trust. Some of the largest players focusing on innovation include IBM Food Trust, and Microsoft's Azure FarmBeats. In turn, large industry players are making demands of their suppliers and requiring they implement technologies⁵², such as IoT and blockchain, in order to support their traceability efforts. Sensors and software are being used to track extensive information about raw materials (e.g. field observation), supplies (e.g. efficiently monitoring levels), ingredients (e.g. trends and patterns) and final products (e.g. standards).

Figure 8: Innovations being explored by the Lincoln Institute for Agri-food Technology (LIAT)⁵¹

Robotics and automation	The field of robotics and automation is a key strategic theme, looking at the development of innovative solutions to food and farming
Net zero agriculture and carbon	Considering the impact of carbon sequestration and ways in which soil health might be measured using applied technologies and data sciences
Robotic phenotyping	By using robots to consistently and repeatably observe and measure crop growth, we are able to help inform plant breeders and growers about the performance of a type of plant or group of plants
Food safety and security	Digital and extended connected capability support the evidencing of food security pathways, and data sensing and modelling systems allow for forecasting and the development of approaches to risk management
Crop care	Using technology to care for crops involves the deployment of novel sensing systems, data collection, and real time data analysis to help understand the micro-environment of individual plants within a crop
Selective harvesting	Developing systems that identify harvest ready crops can enable reliable and consistent picking/harvesting, using a mix of practical engineering solutions, robotics, vision and sensing systems, data collection sensors, and computer science
Energy efficiency and sustainability	Developing solutions for the energy efficiency and sustainability of food production systems, which include wireless communications, extended data networks, and sustainable energy innovation

² E.g. ShareAction driving change through investor action at Tesco in May 2021 to increase its share of healthy food sales from 58% to 65% of total sales by 2025

Supply chain risk management approaches

Supply chain risk management approaches

Businesses in the food and drink industry have traditionally been able to adapt quickly to changing supply chain conditions but the pace of change, volatility and uncertainty experienced since the onset of the pandemic has forced many to question and improve that resilience and find ways to manage problems away. Many companies are nearshoring production closer to their markets where just-in-time models have not been resilient enough to disruptions. Food and drink businesses around the world are actively taking steps, such as moving sites or investing in automation to reduce supply chain risks and achieve long-term stability.

Food and drink businesses have risk management processes in place for most risk areas, with alert systems in place to flag emerging threats and prompt corrective action. When asked in WTW's Global Food and Beverage survey, few businesses have embedded

this in strategic planning, capital allocation and other processes requiring action from the board (20% for supply chain). Despite these issues, businesses generally feel they are on top of many of their risks. Almost 9 in 10 (89%) felt that they have some level of control over the root causes of the risks they face, but only 24% said this was completely under their control, so there is more to be done and an opportunity for the insurance ecosystem to support understanding.

Views on organisational and supplier resilience varied amongst the businesses we spoke with. Broadly speaking, most felt that although plans were in place there was room for further improvement. Testing of plans both internally and with suppliers themselves was seen as a key action.

Box 8: Technology trends

As well as suppliers' technology, businesses are increasingly embracing digital solutions to drive greater operational efficiency, predominantly through investment in automation, robotics, AI, digital business systems and the cloud. However, the lack of available and/or affordable technology can hold the industry back. There are inherent risks with new 'kit' and it comes with additional costs. Cyber security from increased technology and related data presents an evolving risk. IT business continuity planning (BCP) and resilience testing is seen as a necessity. Investments in technological advancement will be a primary development area for clients along with management of the related risks from its introduction.

"Automation and robotics change the risk profile. It's better as it means lower human health and safety error or fewer incidents, more space for the reduced numbers to work in, potentially better concentration, more valued people and less ability to take short cuts. However, new tech requires new training, new competences, new people, different health and safety procedures."

Head of Logistics and Operations at a food company

"Cyber security was flagged up two years ago. We're investing more and more and increasing resilience. We couldn't get cyber insurance at the price we wanted, so we halved coverage."

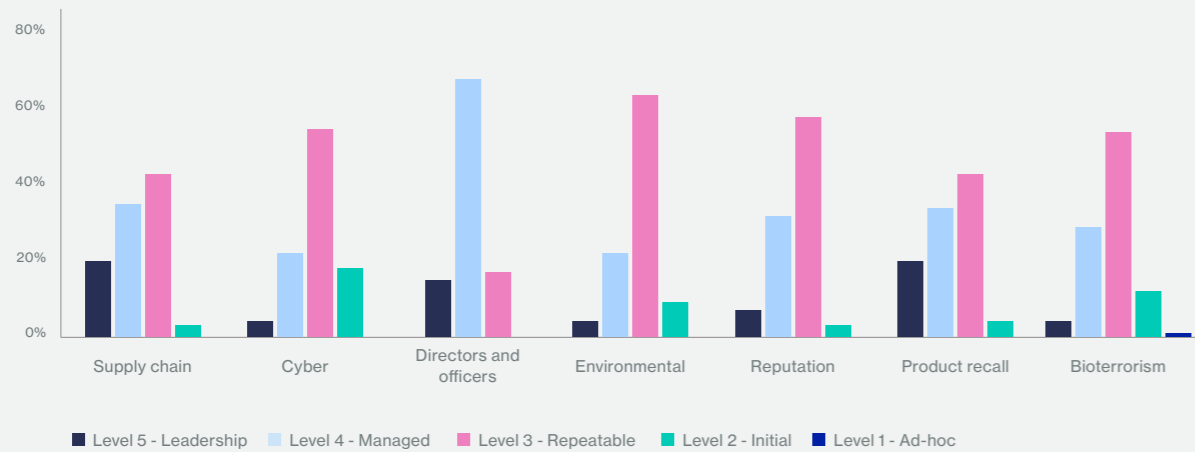
Head of Risk at a food manufacturer

The rise of data analytics within food and drink systems has also resulted in commodity management at the most minute level. Cargill have been investing in Global Innovation Centres to develop insights into new ways to improve productivity and fish welfare, as well as creating technology solutions to support the industry. To assist shrimp farmers to better understand weather and disease risks, Cargill developed the first cloud-based solution in the aquaculture industry, dubbed iQShrimp, in conjunction with its iQuatic digital platform that utilises machine learning, sensors, mobile devices, and automated feeders to record data about shrimp size, water quality, feeding habits, and weather⁵³.

Lloyd's has been supporting the market with insights into key technology trends, with further information available in reports like – [Cyber risk: The emerging cyber threat to industrial control systems](#), [Safeguarding intellectual property](#), and [Networked World](#).

When asked to indicate their organisation’s approach to risk management 20% of businesses we spoke to felt they were managing their risks to a leadership level, and a further 35% indicated an advanced level of risk management (the maturity model level was hidden from them but the descriptions were provided).

Figure 9: Approaches to risk management across key risks



Source: WTW Global Food and Beverage Survey

Maturity level descriptions:

Level 5 Leadership:

Risk management is embedded in strategic planning, capital allocation and other business processes. Limits and early warning systems are in place to identify breaches and require corrective action from board and management.

Level 4 Managed:

Risk management is coordinated across business areas. Tools and processes are used. Risk identification, monitoring, measurement and reporting are in place.

Level 3 Repeatable:

Risk management processes are in place and operated in a timely, consistent and sustained way. Action is taken to address high priority issues.

Level 2 Initial:

Risk management processes are in place, but they may not always operate consistently and effectively. Certain risks are defined and managed in silos, rather than consistently throughout the organisation.

Level 1 Ad-hoc:

We do not have standardised risk management process, and rely on the individual efforts of staff to identify, monitor and manage risks.

The Business Continuity Institute (BCI) 2021 Supply Chain Resilience report⁵⁴ sheds more light on developments across supply chain management, with more than three-quarters of organisations (75.2%) report checking that key suppliers have business continuity arrangements in place, up from two-thirds in 2019. Interestingly, most professionals admitted this was not due to COVID-19, but rather ongoing reviews of how suppliers should be managed (see Box 9 for examples of standards and industry initiatives surfacing supply chain data points and maturity proxies). Further, more than half now request full details of business continuity programmes from their suppliers rather than asking whether a plan is in place without documented evidence.

One leading international food and drink company spoke about how they were integrating supply chain planning software, in this case Optimity, to support business continuity planning. The software allows them to explore and apply demand forecasting, supply chain optimisation, inventory optimisation, sales and operations planning, ABC analysis³, production scheduling and network design. This has allowed the business to simulate and compare multiple scenarios to mitigate supply chain risks – information that could underpin discussions with insurance professionals.

It was clear from the interviews that supply chain professionals tend to carry out operational risk management as part of day-to-day practice. However, the differentiator compared to previous years is the pace of change, volatility and uncertainty experienced since the onset of the pandemic. As one supply chain risk manager stated:

“ I’ve been in the (supply chain) business for the last 25 years but I’ve never seen as much disruption as in the last two years **”**
Supply Chain Director, major food manufacturer

There was also real interest in the opportunity to share risk registers with the insurance industry in ‘Chatham House’ knowledge exchange sessions to identify and secure new/better insurance solutions.

Respondents confirmed that there was a greater focus on risk by organisations and in one case the organisation had set up a specific supply chain working group that had created a dedicated supply chain risk register focusing on key priorities such as raw materials, packaging, cyber, driver availability, fuel etc. This particular organisation worked to horizontally integrate its Tier 2 and 3 suppliers and actively worked towards getting ‘to the back end’ of the supply chain in order to better understand the risks and identify effective mitigations. As a result they were able to identify 15 “factory killers” at both Tier 2 and 3 levels and work towards mitigating them appropriately.

Looking forward, respondents shared best practice about the ways they are managing and responding to supply chain risks. What is clear is that food and drink businesses are actively managing their risks, with clear examples of leadership:

³ **ABC analysis** is an inventory management technique that determines the value of inventory items based on their importance to the business. ABC ranks items on demand, cost and risk data, and inventory managers group items into classes based on those criteria.

Figure 10: Best practice approaches to managing supply chain risks, highlighted in our discussions with risk professionals

<p>Getting supply chain resilience on leadership's agenda</p>	<ul style="list-style-type: none"> - Strong recognition and support from leadership is critical - Joint business planning with key partners. This includes physical in-person checks with suppliers using audit style check-lists that encompass resilience
<p>Sharing to build resilience</p>	<ul style="list-style-type: none"> - Improved collaboration & effective Business Continuity Plans across internal teams, e.g. procurement, commercial, operations & risk management - Exchanging/sharing business continuity plans with trusted partners - Controlled sharing of IT
<p>Identification of risks</p>	<ul style="list-style-type: none"> - Stronger solvency checks - Better identification of physical risks to key supplier sites, and establishing greater visibility of higher risk suppliers and near-shoring or establishing secondary suppliers who can respond in the face of disruption. This is being led by supply chain and procurement working in tandem on shared problems – this is seen in businesses with mature understanding of risk - Reducing over reliance on key suppliers – spreading the risk – both for existing & alternative ingredients and consumables. In some cases this is being enabled by the use of data platforms and software, which is increasing visibility of the complex web of tiered suppliers in and down the chain. E.g. Walmart and IBM Food Trust
<p>Adapting business models</p>	<ul style="list-style-type: none"> - Working towards a business model that is more adaptable to changing circumstances. For example, in the case of key ingredients identifying suitable substitutes and changes, and talking to retailers on would A or B be a replacement – and embedding and contracting these changes - Businesses are taking greater control of the supply chain themselves by having dedicated specialists at the coalface for overseas procurement and transportation of produce, in-house freight forwarders, import teams & customs advisors and by on-shoring sourcing - Further in-advance ordering of raw materials, consumables and equipment and finding ways to improve 'buffer stocks'

Standards for vetting processes for suppliers varied across respondents from minimum levels to extensive investigations. The need to vet suppliers beyond Tier 1 was a growing area of interest and that existing suppliers needed to be vetted to the same standards as new providers. An interesting point was raised around who should be responsible for vetting suppliers. This normally sits with procurement but the argument was put forward that a multi-disciplinary team would be better placed to carry out a more thorough process.

This need for partnerships was a consistent theme, with one risk leader underlining the importance of establishing solid foundation relationships with suppliers and creating long term partnerships. In their particular case this included the extension of financial loan arrangements and factoring to some of their

suppliers to enable improvement of processes and services. Another suggested they would be looking at supplier business continuity plans and identifying learning from those to integrate into their own plans – from both ESG and resilience perspectives (as well as purely supply chain resilience). Supplier size issues were also highlighted in terms of keeping the process proportionate to the risk and not drowning a small supplier with requirements and standards they are unable to meet and may not necessarily need to.

“ We completely control our own supply chain; we own our fleet of trucks; we have a freezer facility, so we have buffer stock if there's an outage, and a number of production sites to ensure continuity **”**

Director of Risk and Insurance at a food manufacturer

“ We are undertaking a program of process improvement that will create clear standards and expectations around processes across business **”**

Health, Safety, Environment and Risk Director at a food manufacturer

“ We have operational resilience delivered through self-managed and well-established manufacturing and distribution networks **”**

Company Secretary and Head of Group Risk of a drinks manufacturer

“ We are analysing commercial risks, e.g. we question if there is over-reliance on certain retailer or certain supplier **”**

Health, Safety, Environment and Risk Director at a food manufacturer

Box 9: Standards and industry initiatives surfacing supply chain data points and maturity proxies

As with any industry, data is always in demand, and while many organisations have a data supply chain they do not have full visibility into what that supply chain entails in its entirety, including visibility among partners. The standards landscape of the food and drink industry are currently characterised by general business continuity management systems and constituent elements that make up the supply chain as a whole, such as sustainability procurement and environmental management systems. Two examples include ISO 9001:2015 and FSSC 22000.

- ISO 9001:2015 can be used to help address the internal risk factors that affect an organisation's broader supply chain. By engaging staff in quality management, it facilitates greater accountability and transparency and ensures internal continuity. Section 6.1 'Risk and Opportunities' can be used to bring focus to the supply chain between the vendors and the beginning of a business's own manufacturing
- FSSC 22000 is a certification scheme for Food Safety Management Systems based on existing standards for certification (ISO 22000, ISO 22003 and technical specifications for sector PRPs). It is applicable to all organisations providing transport and storage services in the food industry

Understanding the need to drive action, the food and drink businesses have been exploring industry initiatives:

- The Supply Chain Optimization (SCO) initiative has been creating tools and frameworks to enable trust and collaboration within the foodservice supply chain, and improve supply chain visibility through improved tracking, traceability and transparency. The International Foodservice Manufacturers Association, Kinetic12 and Havi engaged 15 leading chain restaurants, 18 manufacturers and 8 distributors, in conjunction with the industry associations IFDA, FSMA, NCCR, GS1, and the US National Restaurant Association. The objective of SCO was to evaluate how to optimize supply chain practices across all key stakeholders and co-author best practices to benefit the total foodservice industry and its supply chain
- The Global Food Safety Initiative (GFSI) is a Coalition of Action from the Consumer Goods Forum, bringing together over 40 retailers and manufacturers to oversee food safety standards for businesses. While many companies share goals on delivering safe food, GFSI's focus is on enabling and deepening cooperation and collaboration within and amongst manufacturers, suppliers, the agriculture industry, academia, and governments

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